User's Guide to SEER*Stat Cohort Relative Survival

Including Conditional Survival

Cancer Survival and Prevalence Analytic Network (C-SPAN)

Prepared by
CancerCare Manitoba for
the
Canadian Partnership Against Cancer

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Overview

This document describes the SEER*Stat (1) steps used by the Cancer Survival and Prevalence Analytic Network (C-SPAN) to estimate relative survival, using the cohort method. The following example session describes the steps for obtaining one-year cohort relative survival estimates, based on 3-month follow-up intervals, for all cancers, colorectal, lung, breast and prostate cancers and all cancers excluding colorectal, lung, breast and prostate. Estimates are produced for four three-year diagnosis periods: 1994-1996, 1997-1999, 2000-2002, and 2003-2005. However, the selections made in this session can easily be tailored to your specific situation.

In addition, instructions are given to show how to compute conditional survival, that is, survival proportion or ratio at a specified interval post-diagnosis, conditional on an initial survival interval, through the parameters tab.

Note that the graphics displayed in the document were derived from screen captures of actual SEER*Stat sessions. However, this document has grown over time, and some of the SEER*Stat versions used may not be current. The default options and placement of options within a given SEER*Stat tab may differ between what is displayed here and what can be seen in a more current version.

Data

The survival analyses employ data extracted from the Manitoba Cancer Registry and include the first primary invasive malignant cancer (excluding basal and squamous cell skin cancers) or in situ bladder cancer diagnosed during the period 1992-2005, with complete follow-up until the end of 2006. C-SPAN cancer site definitions follow the 2009 Canadian Cancer Statistics (CCS) groupings (2), which are in turn based on SEER site groups for primary site, based on ICD-O-3 (3).

Life Tables

Life tables shared by Larry Ellison at Statistics Canada, which are used in the computation of relative survival estimates for the CCS publication (2), are also used in C-SPAN's SEER*Stat applications. These life tables provide probabilities of surviving one year by province, sex, attained age and attained calendar period (1991, 1996 and 2001).

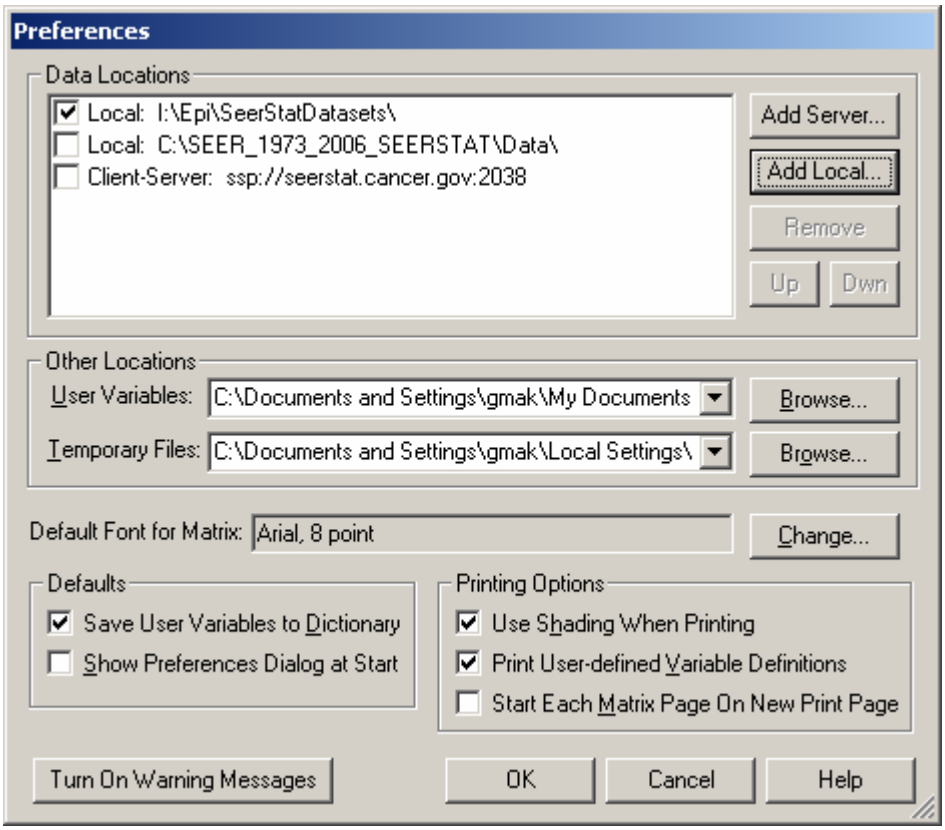
Cases where attained year is from 1992 to 1993 are associated with probabilities of surviving from the 1991 calendar period [data from the 1990/1992 life tables (4)], cases where attained year is from 1994 to 1998 are associated with probabilities of surviving

from the 1996 calendar period [data from 1995/1997 life tables (5)] and because life tables after 2001 are unavailable, all cases where attained year is after 1998 are associated with probabilities of surviving from the 2001 calendar period [data from the 2000/2002 life tables (6)].

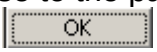
Description of the SEER*Stat Steps for Cohort Survival Estimates

1. Set Data Locations:

- File – Preferences…

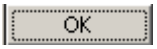


- Click

- Browse to the path where databases are stored *(e.g. I:\Epi\SeerStatDatasets)*
- Click 

    - The path appears at the bottom of the Data Locations list, selected and highlighted.

- With the path selected and highlighted, click

until it is at the top of the Data Locations list
- Click 

    - Databases stored in the added data location will now appear in session Data tabs

2a. Create and save a new Survival session:

- File – New – Survival Session (or button)
  - Warning may appear ("Not to be quoted outside the registry"). Select "Do not show this message in future."
  - Alert may appear ("Could not locate the default expected rate table. Switching to first available table."). Click .
- *(Optional)* File – Save As… *filename*.ss **.ss = survival session file*

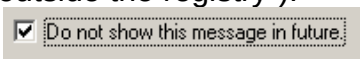
  Note: It is not necessary to save a session if it will be executed and a results matrix saved before closing the session. When a results matrix is saved, information about the session that created it is also stored and can be retrieved as needed using Retrieve Session from the Matrix menu.

or

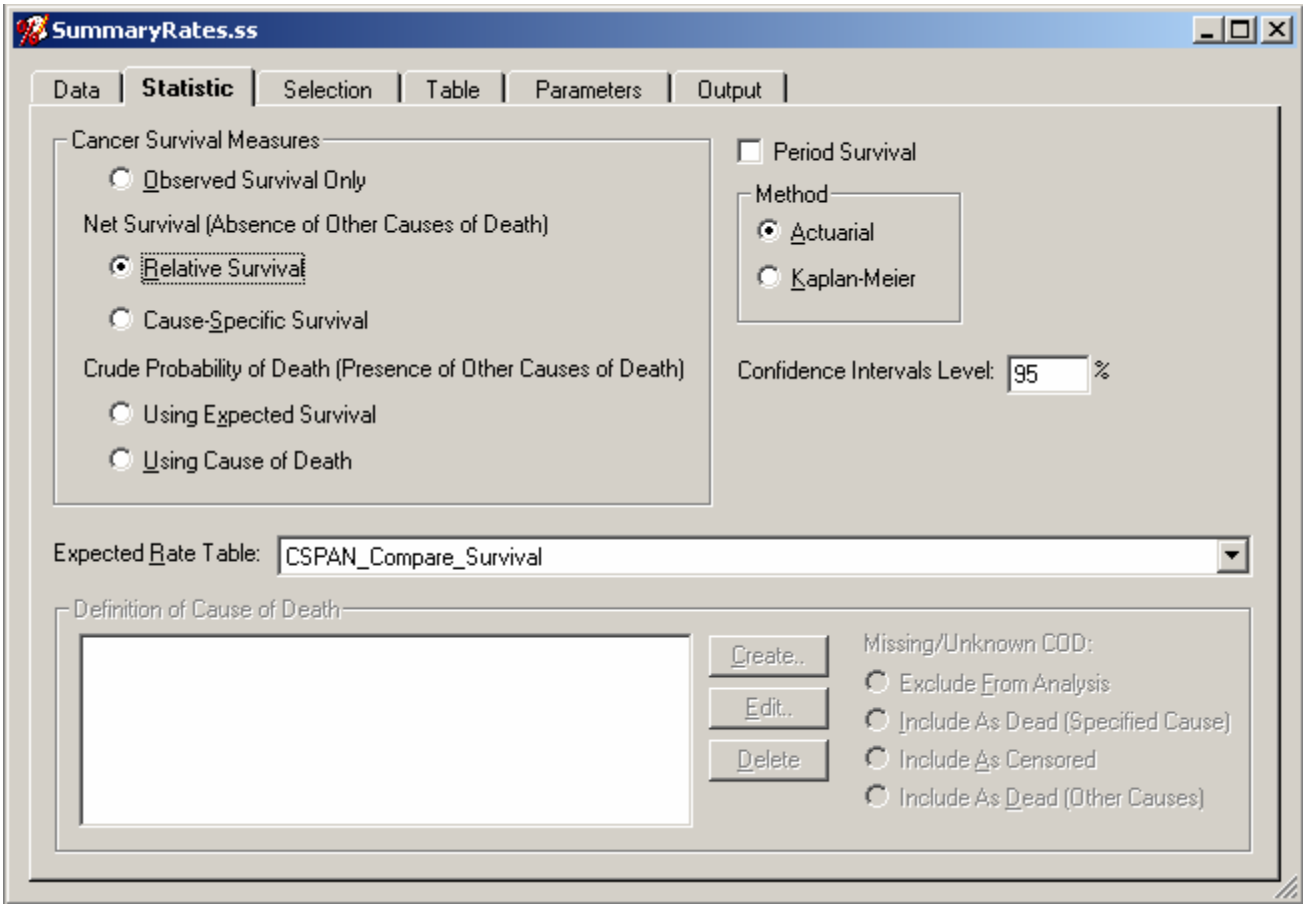
2b. Open an existing Survival session:

- File – Open – Survival File… (or button) *path:\filename*.ss **.ss = survival session file*

3. Data tab:

- Select Database Name: CSPAN_Compare
  - Warning may appear ("Not to be quoted outside the registry"). Select "Do not show this message in future." 
  - Alert may appear ("Could not locate the saved expected rate table. Switching to default."). Click .
- *(Optional)* File – Save (or button)

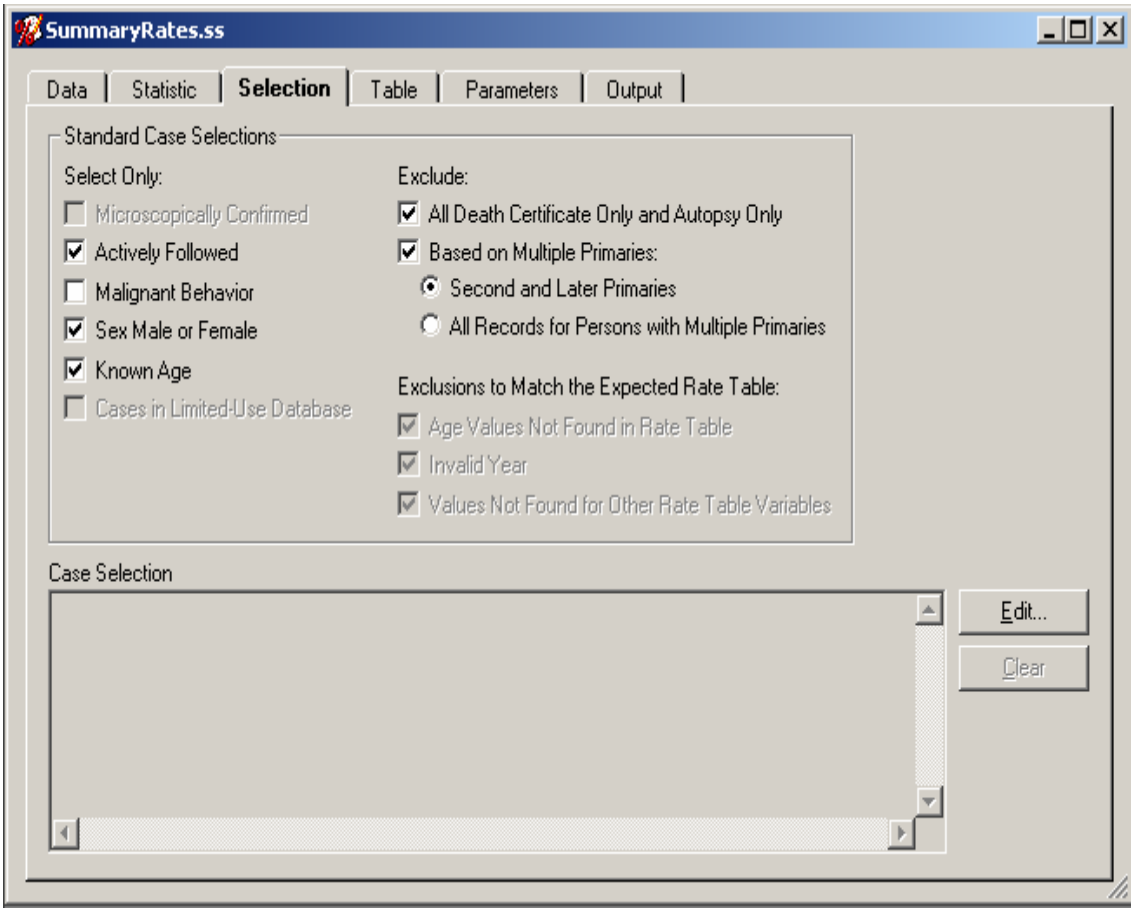
4. Statistic tab:



- Accept defaults except:
    - Select Expected Rate Table: CSPAN_Compare_Survival

- *(Optional)* File – Save (or button)

5. Selection tab:



- Accept defaults except:
    - *De*select: Malignant Behavior

- *(Optional)* File – Save (or button)

6. Create variables in the Dictionary for the Table tab:

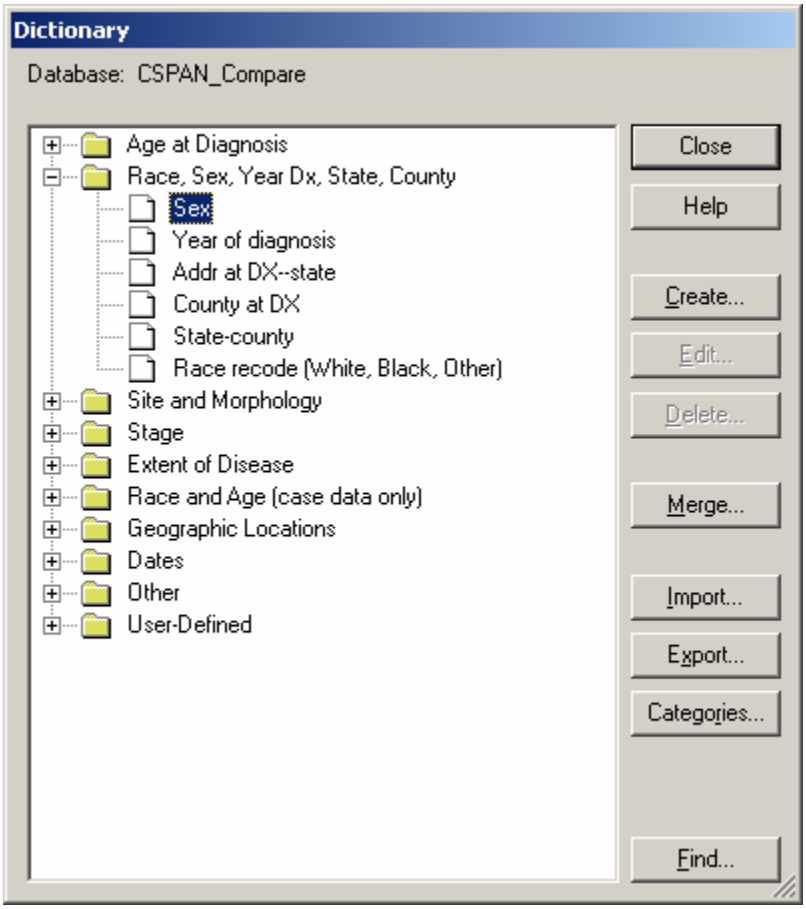
- Variable groupings needed:

  i. Sex
     - Male and female **already exists in the Dictionary; no need to create it*
     - Male **already exists in the Dictionary; no need to create it*
     - Female **already exists in the Dictionary; no need to create it*

  ii. CCS Disease
     - All *(i.e. all cancer types)*
     - Colorectal
     - Lung
     - Breast
     - Prostate
     - Others *(i.e. all cancer types except colorectal, lung, breast, and prostate)*

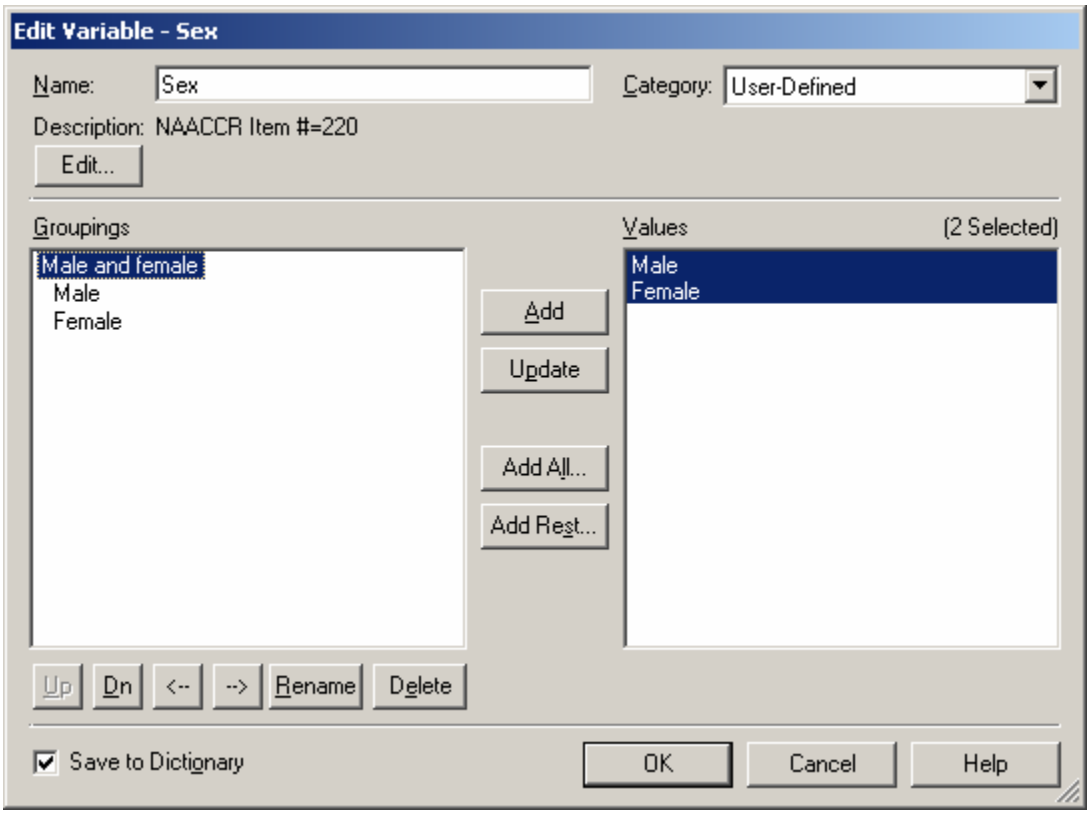
  iii. Year of Diagnosis
     - 1994 - 1996
     - 1997 - 1999
     - 2000 - 2002
     - 2003 - 2005

- File – Dictionary… (or button)



➢ To view and verify existing Sex variable groupings:

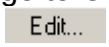
- ⊞ (Expand) Race, Sex, Year Dx, State, County
- Select Sex
- Click Create... to open the Edit Variable window



- Groupings column: Select Male and female
  - In the Values column, both Male and Female are highlighted to indicate they are included in the Male and female grouping.
- Groupings column: Select Male
  - In the Values column, Male is highlighted to indicate it is included in the Male grouping.
- Groupings column: Select Female
  - In the Values column, Female is highlighted to indicate it is included in the Female grouping.
- Click Cancel

➢ To create CCS Disease variable groupings:

- ⊞ (Expand) Site and Morphology
- Select CCS
- Click

to open the Edit Variable window
- Name: change to CCS**4**
- Description: 

and change to '**Top 4** CCS (2009) Disease Groups'
- Groupings column: Select all 24 groupings *(i.e. Oral, Esophagus/Oesp, … Other)*
- Click

to clear all the individual cancer type groupings

****

- Click

- Select "Added as one grouping (all values combined)" Click

.
  - "All Values" appears in the Groupings column
  - All 24 cancer types are highlighted in the Values column
- Groupings column: Rename "All Values" as "All"

****

- Values column: Select ColoRectal. Click

.
  Select Lung. Click

.
  Select Breast. Click

.
  Select Prostate. Click

.
  - "ColoRectal", "Lung", "Breast", "Prostate" appear in the Groupings column
  - When each is selected in the Groupings column, the corresponding cancer type is highlighted in the Values column

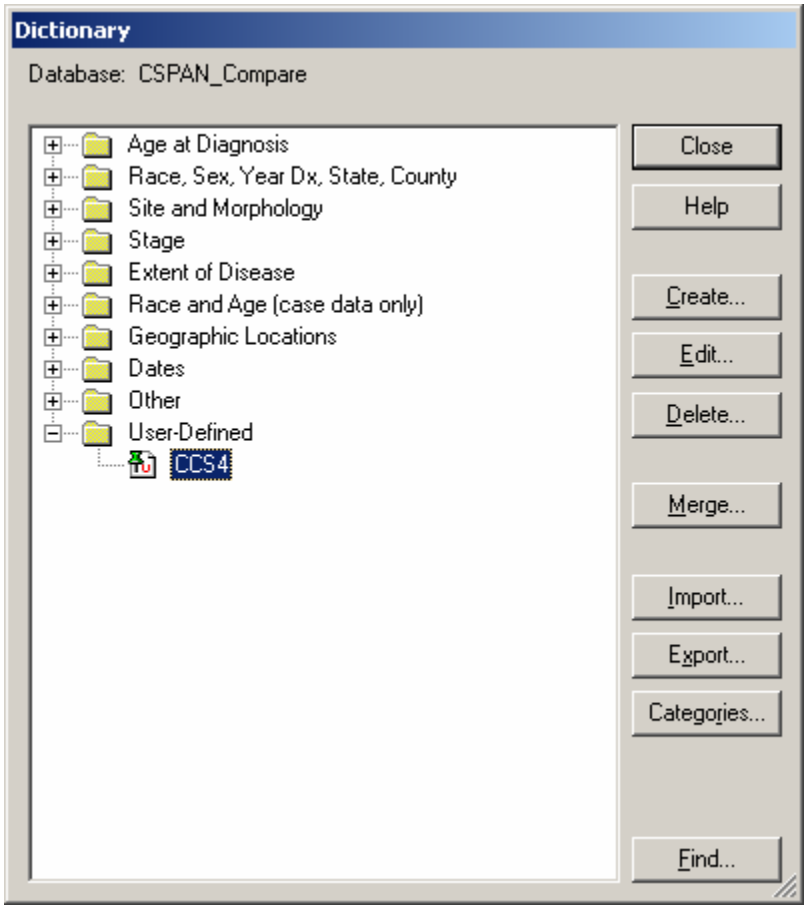
****

- Values column: Select all cancer types except ColoRectal, Lung, Breast, Prostate. Click Add.
    - "Oral" appears in the Groupings column (the new grouping takes the name of the first cancer type selected for the grouping from the Values column)
    - 20 cancer types (all except ColoRectal, Lung, Breast, Prostate) are highlighted in the Values column
- Groupings column: Rename "Oral" as "Others"

****

- Ensure "Save to Dictionary" is selected ☑ Save to Dictionary
- Click OK
    - Newly created "CCS4" variable appears in the Dictionary window in the User-Defined category

    * = *a user-defined (or merged) variable saved in the database dictionary*



➢ To create Year of Diagnosis variable groupings:

- ⊞ (Expand) Race, Sex, Year Dx, State, County in Dictionary window
- Select Year of Diagnosis
- Click [Create...] to open the Edit Variable window
- Name: change to Year of diagnosis **(3-yr windows)**
- Description: [Edit...] and change to NAACCR Item # = 390 **(3-yr windows)**
- Groupings column: Select all 16 groupings *(i.e. Total, 1992, … 2006)*
- Click [Delete] to clear all the individual year groupings

****

- Values column: Select 1994, 1995, 1996. Click [Add].
  Select 1997, 1998, 1999. Click [Add].
  Select 2000, 2001, 2002. Click [Add].
  Select 2003, 2004, 2005. Click [Add].

  - "1994", "1997", "2000", "2003" appear in the Groupings column (the new groupings take the name of the first year selected for the grouping from the Values column)

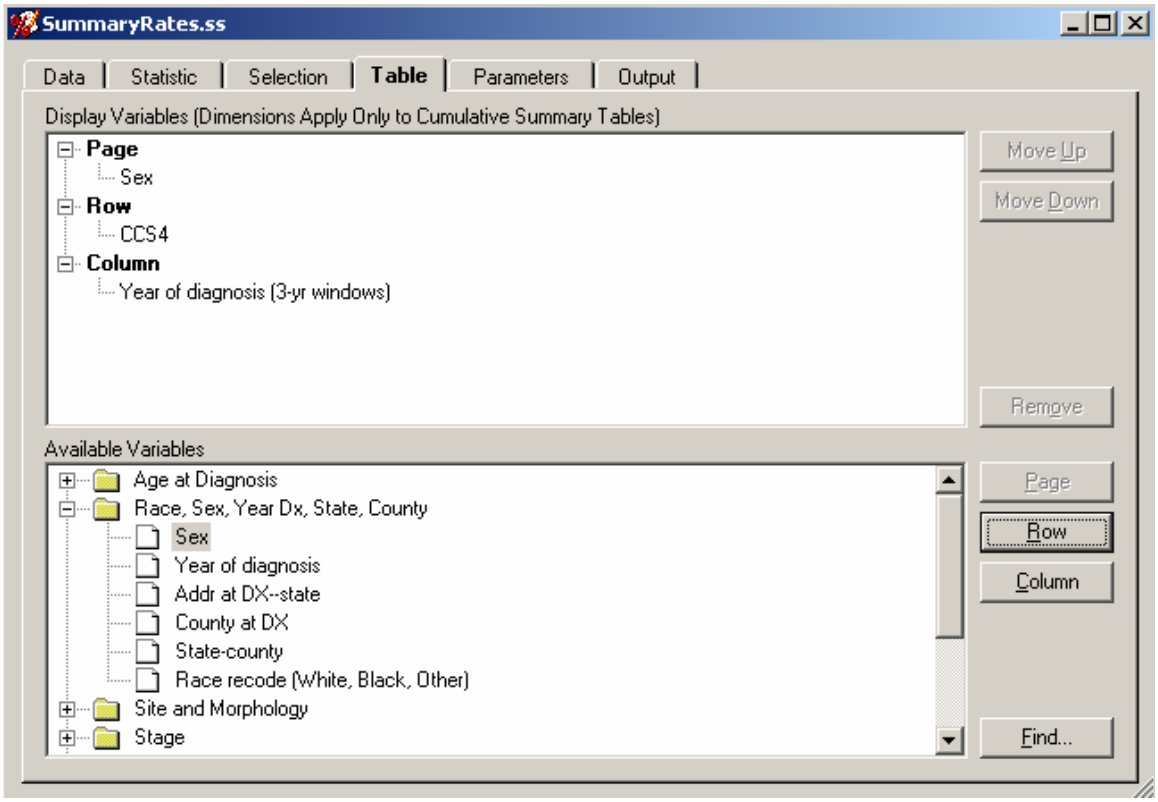
- Groupings column: Rename "1994" as "1994-6"
  Rename "1997" as "1997-9"
  Rename "2000" as "2000-2"
  Rename "2003" as "2003-5"

  - When each is selected in the Groupings column, the corresponding years are highlighted in the Values column

****

- Ensure "Save to Dictionary" is selected [☑ Save to Dictionary]
- Click [OK]
- Newly created "Year of diagnosis (3-yr windows)" variable appears in the Dictionary window in the User-Defined category
  * = *a user-defined (or merged) variable saved in the database dictionary*
- In the Dictionary window, Click [Close]
- *(Optional)* File – Save (or [💾] button)

7. Table tab:

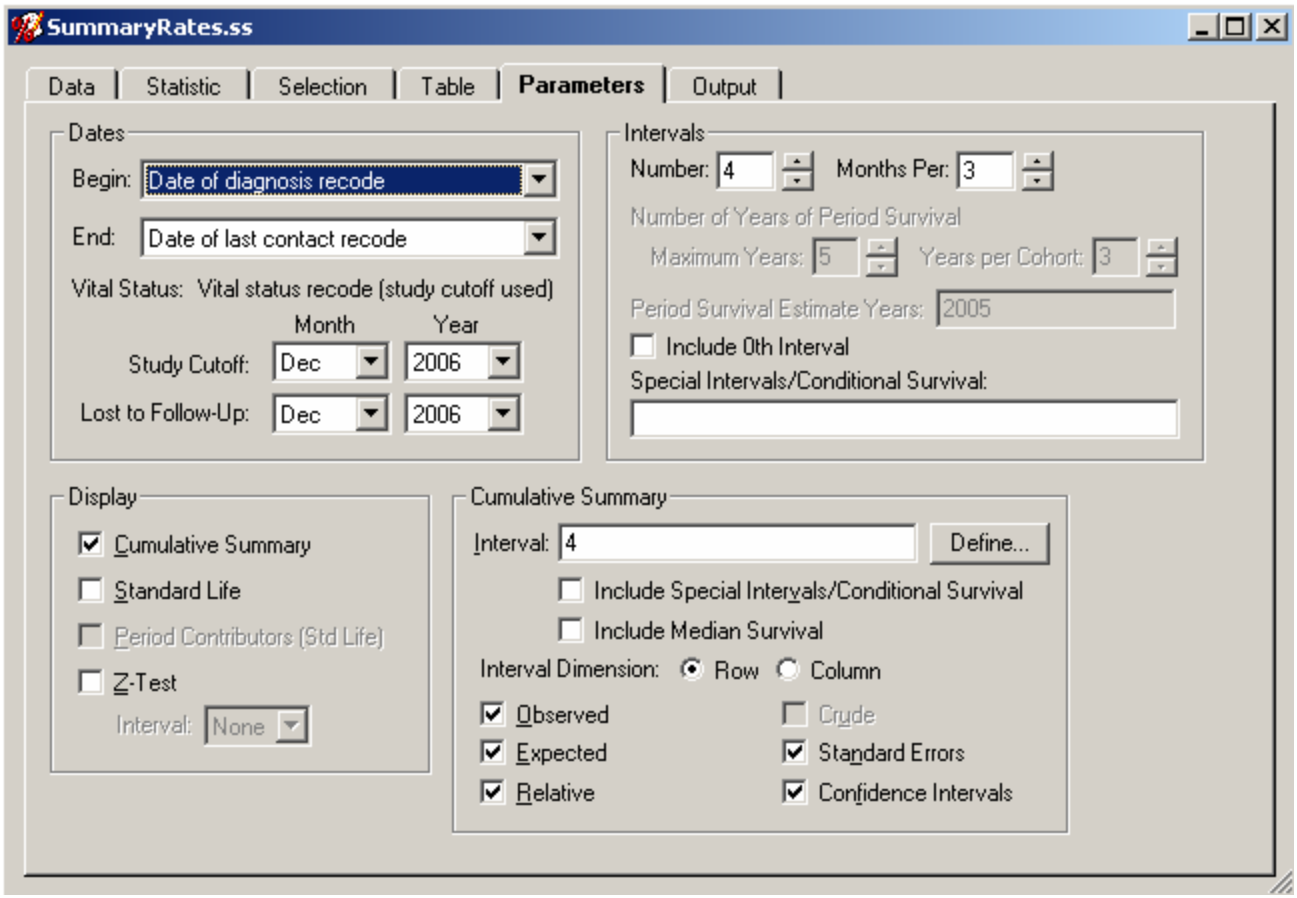


- In Available Variables, ⊞ (Expand) Race, Sex, Year Dx, State, County
- Select Sex
- Click Page
    - "Sex" appears under Page in Display Variables

- In Available Variables, ⊞ (Expand) User-Defined
- Select CCS4
- Click Row
    - "CCS4" appears under Row in Display Variables

- In Available Variables, ⊞ (Expand) User-Defined if necessary
- Select Year of diagnosis (3-yr windows)
- Click Column
    - "Year of diagnosis (3-yr windows)" appears under Column in Display Variables
- *(Optional)* File – Save (or button)

8. Parameters tab:



- Accept defaults except:
    - Intervals
        - Number: 4
        - Months Per: 3
    - Cumulative Summary – Interval: 4

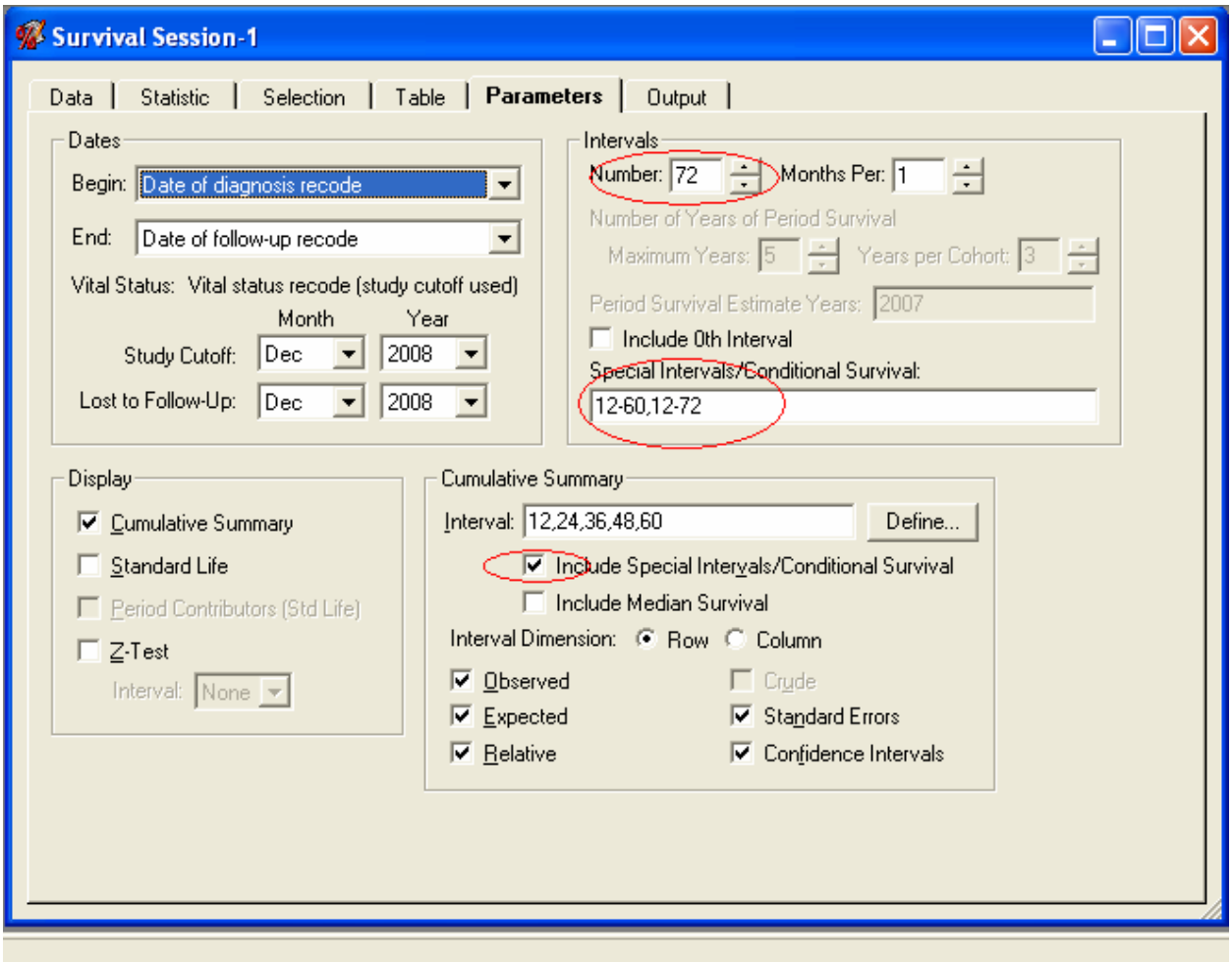
  Choosing these will provide one-year cumulative survival estimates based on 3 month intervals.

- *(Optional)* File – Save (or button)

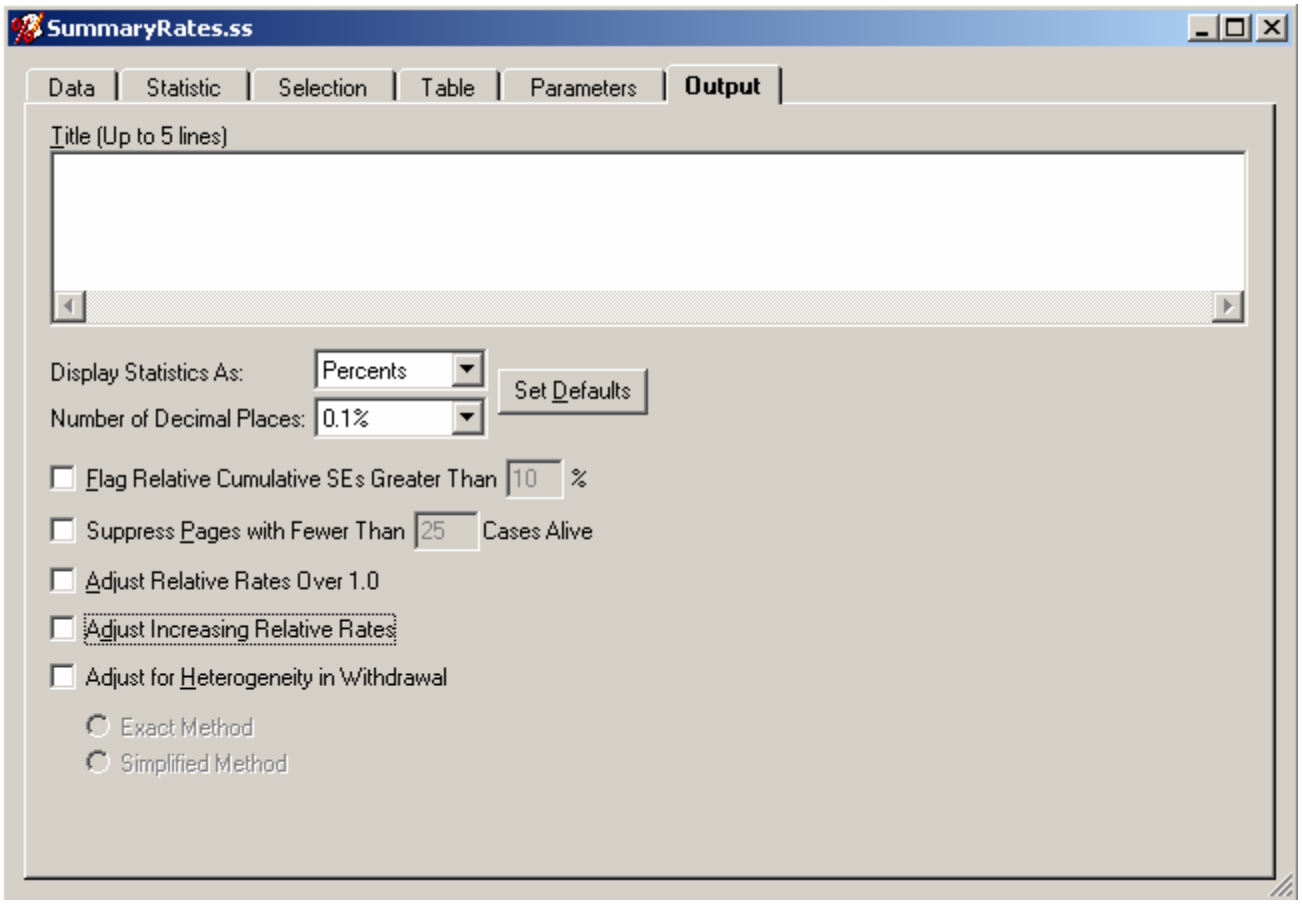
- *(Optional)*
  Conditional survival: Below is an example of how to specify two conditional survival estimates. The first, representing surviving to 5 years after diagnosis, conditional on having already survived the first year (expressed in months of

survival, as 12-60). The second, survival to the 6th year post-diagnosis, conditional on having survived the first year after diagnosis (again, expressed in months as 12-72).

- Note the differences from the example above: the largest interval specified must not be greater than the total number of intervals specified (in this case, 72). In order to have the special intervals represented in the output, the checkbox for 'Include special intervals/conditional survival' must be checked.



9. Output tab:

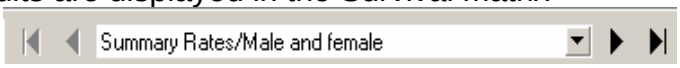


- Accept defaults except:
    - *De*select: Adjust Relative Rates Over 1.0
    - *De*select: Adjust Increasing Relative Rates

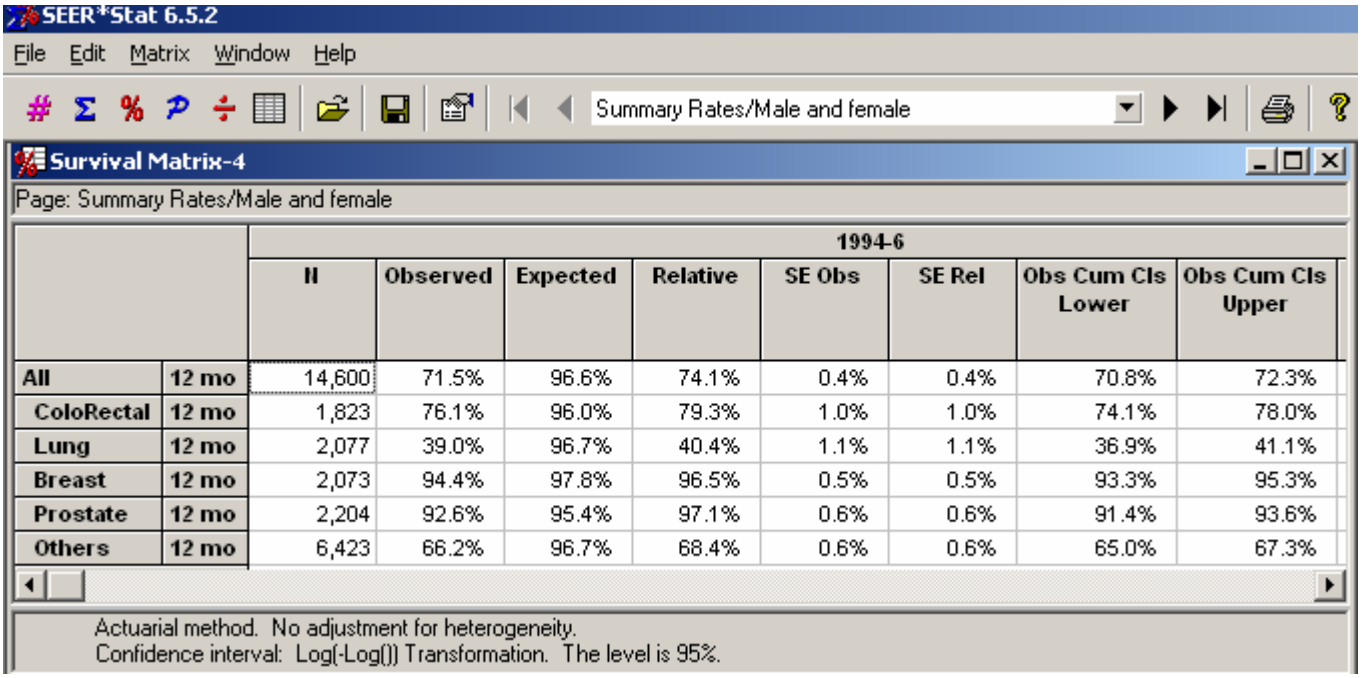
- *(Optional)* File – Save (or button)

10. Execute the Survival session:

- Session – Execute (or button)
  - Results are displayed in the Survival matrix

    Use 

    to view each page (Male and female, Male, Female)



		1994-6							
		II	Observed	Expected	Relative	SE Obs	SE Rel	Obs Cum CIs Lower	Obs Cum CIs Upper
All	12 mo	14,600	71.5%	96.6%	74.1%	0.4%	0.4%	70.8%	72.3%
ColoRectal	12 mo	1,823	76.1%	96.0%	79.3%	1.0%	1.0%	74.1%	78.0%
Lung	12 mo	2,077	39.0%	96.7%	40.4%	1.1%	1.1%	36.9%	41.1%
Breast	12 mo	2,073	94.4%	97.8%	96.5%	0.5%	0.5%	93.3%	95.3%
Prostate	12 mo	2,204	92.6%	95.4%	97.1%	0.6%	0.6%	91.4%	93.6%
Others	12 mo	6,423	66.2%	96.7%	68.4%	0.6%	0.6%	65.0%	67.3%

Actuarial method. No adjustment for heterogeneity.
Confidence interval: Log(-Log()) Transformation. The level is 95%.

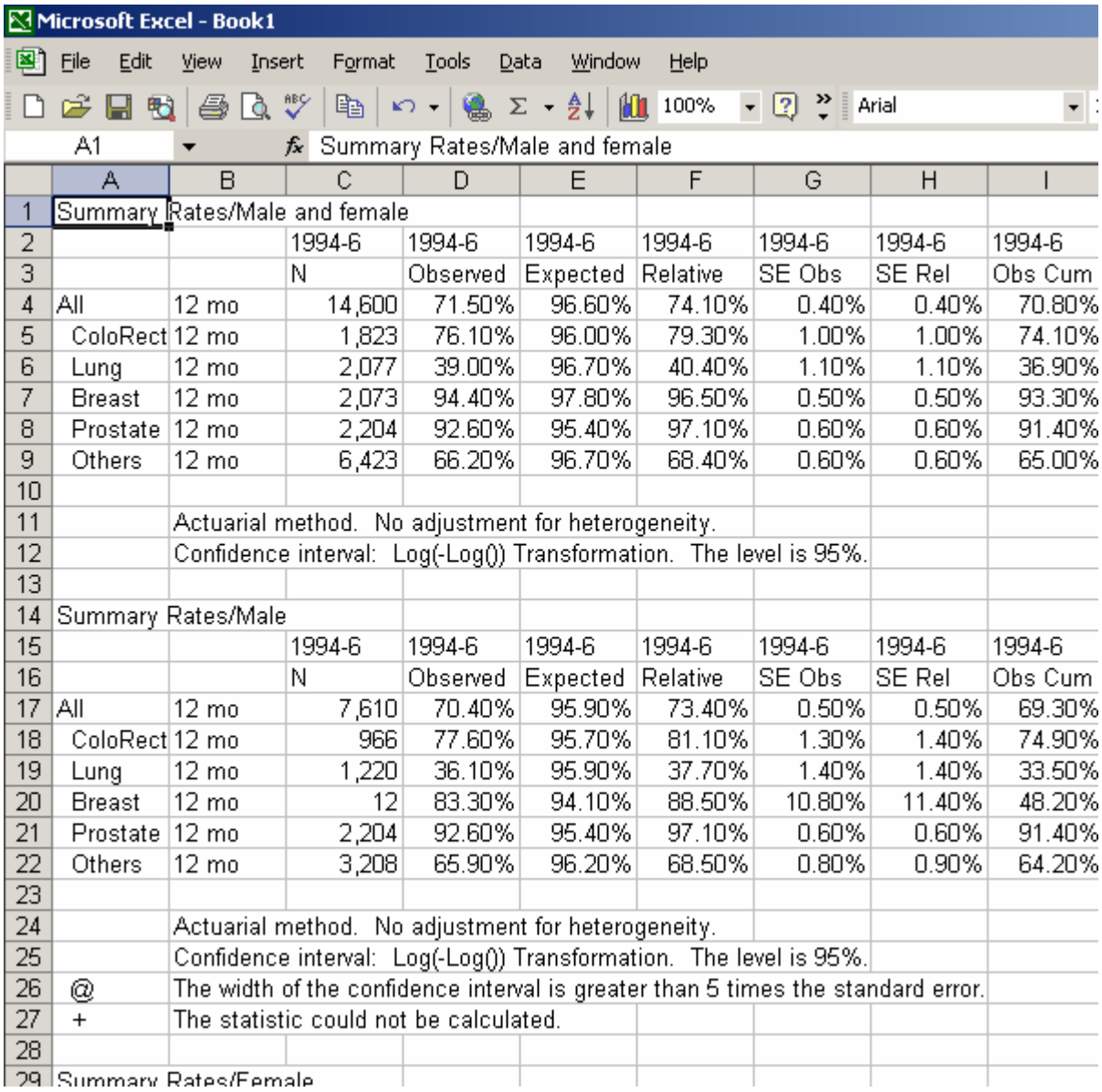
*11a. Save the results in SEER*Stat:*

- Click anywhere inside the Survival Matrix window to ensure it is active
- File – Save As… *filename*.ssm **.ssm = survival matrix file*

and/ or

11b. Save the results and session information in Excel:

- Click anywhere inside the Survival Matrix window to ensure it is active
- Edit – Copy – All Pages (for results)
- In Microsoft Excel: Edit – Paste
  File – Save As… *filename*.xls



Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

100% Arial

A1 Summary Rates/Male and female

	A	B	C	D	E	F	G	H	I
1	Summary	Rates/Male and female							
2			1994-6	1994-6	1994-6	1994-6	1994-6	1994-6	1994-6
3			N	Observed	Expected	Relative	SE Obs	SE Rel	Obs Cum
4	All	12 mo	14,600	71.50%	96.60%	74.10%	0.40%	0.40%	70.80%
5	ColoRect	12 mo	1,823	76.10%	96.00%	79.30%	1.00%	1.00%	74.10%
6	Lung	12 mo	2,077	39.00%	96.70%	40.40%	1.10%	1.10%	36.90%
7	Breast	12 mo	2,073	94.40%	97.80%	96.50%	0.50%	0.50%	93.30%
8	Prostate	12 mo	2,204	92.60%	95.40%	97.10%	0.60%	0.60%	91.40%
9	Others	12 mo	6,423	66.20%	96.70%	68.40%	0.60%	0.60%	65.00%
10									
11		Actuarial method. No adjustment for heterogeneity.							
12		Confidence interval: Log(-Log()) Transformation. The level is 95%.							
13									
14	Summary	Rates/Male							
15			1994-6	1994-6	1994-6	1994-6	1994-6	1994-6	1994-6
16			N	Observed	Expected	Relative	SE Obs	SE Rel	Obs Cum
17	All	12 mo	7,610	70.40%	95.90%	73.40%	0.50%	0.50%	69.30%
18	ColoRect	12 mo	966	77.60%	95.70%	81.10%	1.30%	1.40%	74.90%
19	Lung	12 mo	1,220	36.10%	95.90%	37.70%	1.40%	1.40%	33.50%
20	Breast	12 mo	12	83.30%	94.10%	88.50%	10.80%	11.40%	48.20%
21	Prostate	12 mo	2,204	92.60%	95.40%	97.10%	0.60%	0.60%	91.40%
22	Others	12 mo	3,208	65.90%	96.20%	68.50%	0.80%	0.90%	64.20%
23									
24		Actuarial method. No adjustment for heterogeneity.							
25		Confidence interval: Log(-Log()) Transformation. The level is 95%.							
26	@	The width of the confidence interval is greater than 5 times the standard error.							
27	+	The statistic could not be calculated.							
28									
29	Summary	Rates/Female							

It is good practice to save the session details in the same spreadsheet as the results – in a worksheet tab with a different name. To do so,

- Click anywhere inside the Survival Matrix window to ensure it is active
- Edit – Copy – Session Information
- In Microsoft Excel, in the same spreadsheet as above, but in a new tab:
  Edit – Paste
  File – Save As… *filename*.xls

12. Retrieve and print Survival session information:

If a session is closed without being saved, it can be retrieved if its resulting Survival matrix has been saved.

- File – Open – Survival File… (or button) *path:\filename.*ssm
  **.ssm = survival matrix file*

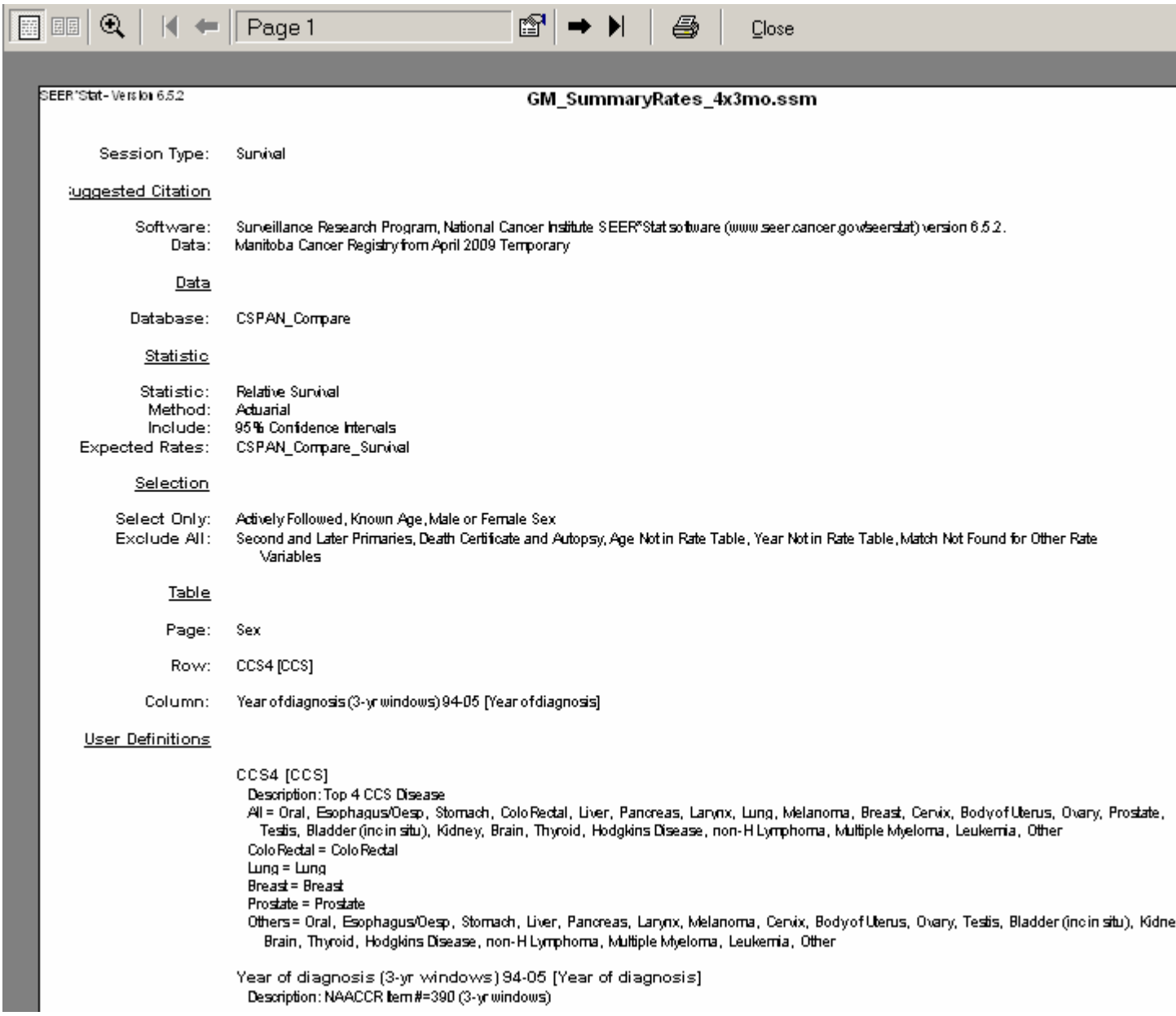
- Matrix – Retrieve Session
  - A Survival session opens with all the settings used to generate the matrix

- To ensure it is active, click anywhere inside either:
  a) the Survival Matrix window to print the matrix and session information
  or
  b) the Survival Session window to print session information only

- File – Print Preview…
  - A preview of pages to be printed opens

  Use

  to view each page


Page 1
Close
SEER*Stat - Version 6.5.2
GM_SummaryRates_4x3mo.ssm
Session Type: Survival
Suggested Citation
Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 6.5.2.
Data: Manitoba Cancer Registry from April 2009 Temporary
Data
Database: CSPAN_Compare
Statistic
Statistic: Relative Survival
Method: Actuarial
Include: 95% Confidence Intervals
Expected Rates: CSPAN_Compare_Survival
Selection
Select Only: Actively Followed, Known Age, Male or Female Sex
Exclude All: Second and Later Primaries, Death Certificate and Autopsy, Age Not in Rate Table, Year Not in Rate Table, Match Not Found for Other Rate Variables
Table
Page: Sex
Row: CCS4 [CCS]
Column: Year of diagnosis (3-yr windows) 94-05 [Year of diagnosis]
User Definitions
CCS4 [CCS]
Description: Top 4 CCS Disease
All = Oral, Esophagus/Desp, Stomach, ColoRectal, Liver, Pancreas, Larynx, Lung, Melanoma, Breast, Cervix, Body of Uterus, Ovary, Prostate, Testis, Bladder (inc in situ), Kidney, Brain, Thyroid, Hodgkins Disease, non-H Lymphoma, Multiple Myeloma, Leukemia, Other
ColoRectal = ColoRectal
Lung = Lung
Breast = Breast
Prostate = Prostate
Others = Oral, Esophagus/Desp, Stomach, Liver, Pancreas, Larynx, Melanoma, Cervix, Body of Uterus, Ovary, Testis, Bladder (inc in situ), Kidne
Brain, Thyroid, Hodgkins Disease, non-H Lymphoma, Multiple Myeloma, Leukemia, Other
Year of diagnosis (3-yr windows) 94-05 [Year of diagnosis]
Description: NAACCR Item #=390 (3-yr windows)

- Click to print

References

1. National Cancer Institute SEER*Stat software. Version 6.5.2. Bethesda, MD: National Cancer Institute, 2009.
2. Canadian Cancer Society's Steering Committee: *Canadian Cancer Statistics 2009*, Toronto: Canadian Cancer Society, 2009.
3. Fritz A, Jack A, Parkin DM, et al (eds.) *International Classification of Diseases for Oncology*. Third Edition. Geneva World Health Organization, 2000.
4. Millar WJ, David P. *Life Tables, Canada and the Provinces, 1990-1992* (Statistics Canada Catalogue 84-537) Ottawa: Minister of Industry, 1995.
5. Duchesne D, Tully P, Thomas B, Bourbeau R. *Life Tables, Canada, Provinces and Territories, 1995/1997* (Statistics Canada Catalogue 84-537) Ottawa: Minister of Industry, 2002.
6. *Life Tables, Canada, Provinces and Territories, 2000/2002* (Statistics Canada Catalogue 84-537) Ottawa : Minister of Industry, 2006.